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**Title:** Ultrafast electron dynamics initiated by attosecond and intense extreme ultraviolet pulses

**Abstract:**

Attosecond pulses are the shortest reproducible events produced so far and their duration is rapidly approaching the atomic unit of time (1 a.u. = 24 as) [1-4], which represents the natural timescale of the electronic motion inside the atom in the Bohr model. In quantum mechanics, this timescale is determined by the inverse of the spacing between energy levels and it ranges between a few femtoseconds and tens of attoseconds for valence and core shell electrons. The first applications of attosecond pulses were mainly focused on simple atoms or molecules to validate new experimental approaches and to gain time-resolved information on processes driven by electron-electron or electron-nuclear correlation. Intense XUV pulses can be generated by Free Electron Lasers. Recently, the first seeded FEL FERMI@Elettra in Trieste Italy became operational. Experimental and theoretical results on the ultrafast dynamics initiated by isolated attosecond pulses in small molecules such as  $\text{CO}_2$  and  $\text{N}_2$  will be presented. The few-femtosecond and attosecond electron dynamics can be probed and controlled using a synchronized infrared few-cycle pulse [5].

**References:**

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